WHAT IS CLAIMED IS

1. A method of training for a recording medium reproduction equalizer, comprising, in a training operation for optimizing a multiplication coefficient for each tap of an FIR equalizer equalizing a read signal read from a recording medium, the steps of:

a) utilizing, as a restricted coefficient updating vector applied for updating the multiplication coefficient for each tap of the FIR filter, a vector obtained from projecting, onto a plane perpendicular to a predetermined restricting conditioning vector, a coefficient updating vector determined based on an equalizer error between the output of the FIR equalizer and a reproduction output determined therefrom, and a delayed input value for each tap of the FIR equalizer; and

b) utilizing, as the predetermined restricting conditional vector, a coefficient vector comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error.

2. A method of training for a recording medium reproduction equalizer, comprising, in a training operation for optimizing a multiplication coefficient for each tap of an FIR equalizer equalizing a read signal read from a recording medium, the steps of:

a) utilizing, as a restricted coefficient

updating vector applied for updating the multiplication coefficient for each tap of the FIR filter, a vector obtained by projecting, onto a plane perpendicular to a predetermined restricting conditional vector, a coefficient updating vector determined based on an equalizer error between the output of the FIR equalizer and a reproduction output determined therefrom, and a delayed input value for each tap of the FIR equalizer; and

b) utilizing, as the predetermined restricting conditional vector, a vector which is a difference between a coefficient vector comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error and another coefficient vector immediately subsequent thereto obtained in the same condition.

3. A method of training for a recording medium reproduction equalizer, comprising, in a training operation for optimizing a multiplication coefficient for each tap of an FIR equalizer equalizing a read signal read from a recording medium, the steps of:

a) utilizing, as a restricted coefficient updating vector applied for updating the multiplication coefficient for each tap of the FIR filter, a vector obtained by projecting, onto a plane perpendicular to a predetermined restricting conditional vector, a coefficient updating vector determined based on an equalizer error between the output of the FIR equalizer and a reproduction output determined therefrom and a delayed input value for each tap of the FIR equalizer; and

b) utilizing, as the predetermined

restricting conditional vector, a vector which is a difference between a subsequent coefficient vector obtained in the same condition immediately subsequent to and an antecedent coefficient vector obtained in the same condition immediately antecedent to a reference coefficient comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error.

4. A recording medium reproduction apparatus comprising:

training part training for a recording medium reproduction equalizer,

wherein:

in a training operation for optimizing a multiplication coefficient for each tap of an FIR equalizer equalizing a read signal read from a recording medium, said training part utilizes, as a restricted coefficient updating vector applied for updating the multiplication coefficient for each tap of the FIR filter, a vector obtained by projecting, onto a plane perpendicular to a predetermined restricting conditional vector, a coefficient updating vector determined based on an equalizer error between the output of the FIR equalizer and a reproduction output determined therefrom and a delayed input value for each tap of the FIR equalizer; and

said training part utilizes, as the predetermined restricting conditional vector, a coefficient vector comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error

5. A recording medium reproduction apparatus comprising:

training part training for a recording medium reproduction equalizer,

wherein:

in a training operation for optimizing a multiplication coefficient for each tap of an FIR equalizer equalizing a read signal read from a recording medium, said training part utilizes, as a restricted coefficient updating vector applied for updating the multiplication coefficient for each tap of the FIR filter, a vector obtained by projecting, onto a plane perpendicular to a predetermined restricting conditional vector, a coefficient updating vector determined based on an equalizer error between the output of the FIR equalizer and a reproduction output determined therefrom and a delayed input value for each tap of the FIR equalizer; and

said training part utilizes, as the predetermined restricting conditional vector, a vector which is a difference between a coefficient vector comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error and another coefficient vector immediately subsequent thereto obtained in the same condition.

6. A recording medium reproduction apparatus comprising:

training part training for a recording medium reproduction equalizer,

wherein:

in a training operation for optimizing a

multiplication coefficient for each tap of an FIR equalizer equalizing a read signal read from a recording medium, said training part utilizes, as a restricted coefficient updating vector applied for updating the multiplication coefficient for each tap of the FIR filter, a vector obtained by projecting, onto a plane perpendicular to a predetermined restricting conditional vector, a coefficient updating vector determined based on an equalizer error between the output of the FIR equalizer and a reproduction output determined therefrom and a delayed input value for each tap of the FIR equalizer; and

said training part utilizes, as the restricting conditional vector, a vector which is a difference between a subsequent coefficient vector obtained in the same condition immediately subsequent to and an antecedent coefficient vector obtained in the same condition immediately antecedent to a reference coefficient comprising the multiplication coefficients for the equalizer obtained upon calculating the equalizer error.

7. The method as claimed in claim 2, wherein:

said coefficient vector immediately subsequent comprises the multiplication coefficients shifted toward the higher order side by one order with respect to those of the current coefficient vector and a predetermined number inserted as the lowest order coefficient.

8. The method as claimed in claim 8, wherein:

said predetermined number comprises zero.

9. The method as claimed in claim 3, wherein:

said coefficient vector immediately subsequent comprises the multiplication coefficients shifted toward the higher order side by one order with respect to those of the reference coefficient vector and a first predetermined number inserted as the lowest order coefficient; and

said coefficient vector immediately antecedent comprises the multiplication coefficients shifted toward the lower order side by one order with respect to those of the reference coefficient vector and a second predetermined number inserted as the highest order coefficient.

10. The method as claimed in claim 8, wherein:

said fir predetermined number comprises zero, and said second predetermined number also comprises zero.

11. The apparatus as claimed in claim 5, wherein:

said coefficient vector immediately

subsequent comprises the multiplication coefficients shifted toward the higher order side by one order with respect to those of the current coefficient vector and a predetermined number inserted as the lowest order coefficient.

12. The apparatus as claimed in claim 11, wherein:

said predetermined number comprises zero.

13. The apparatus as claimed in claim 6, wherein:

said coefficient vector immediately subsequent comprises the multiplication coefficients shifted toward the higher order side by one order with respect to those of the reference coefficient vector and a first predetermined number inserted as the lowest order coefficient; and

said coefficient vector immediately antecedent comprises the multiplication coefficients shifted toward the lower order side by one order with respect to those of the reference coefficient vector and a second predetermined number inserted as the highest order coefficient.

14. The apparatus as claimed in claim 13, wherein:

said fir predetermined number comprises

zero, and said second predetermined number also comprises zero.